User Manual

SR100A

AC/DC POWER SUPPLY & FLOAT CHARGER
FOR LEAD ACID BATTERIES
(low temperature version)

Model Codes: **SR100A …. Standard version**
SR100D …. Standard with 2 relay alarm outputs
SR100L …. Standard with 3 relay alarm outputs
SR100P…. Standard with 2 alarms and internal output diode

Specifications are subject to change without notice. No liability accepted for errors or omissions

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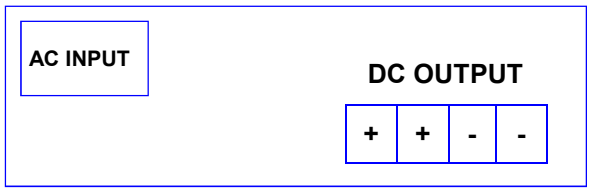
1. INTRODUCTION

The **SR100A** range is designed for use as a very accurate AC to DC power supply, or float charger for lead acid batteries. Note that for float charging the output voltage must be set to approximately 15% above the nominal battery voltage. This is done as the default voltage for the 12V model but must be specified at time of order for all higher voltage models.

2. CONNECTIONS

If used as a float charger always connect the positive output of the power supply to the positive terminal of the battery. The charger may be permanently connected to float charge lead acid batteries but it is essential to periodically check the electrolyte level of flooded cells as there is always some evaporation.
To minimize the volt drop at the output connections use all the terminals provided ie. connect output wires in parallel.

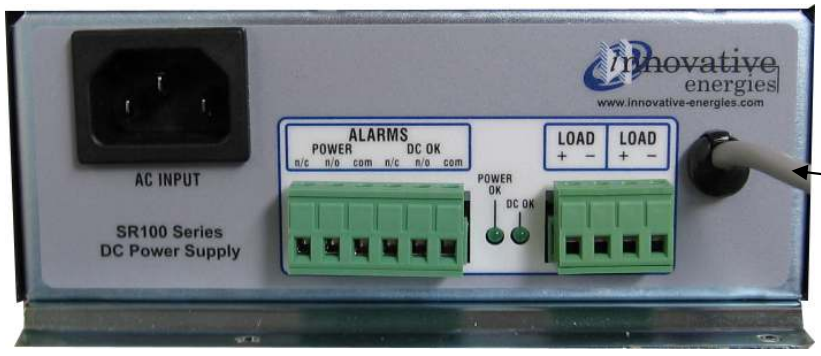
CONNECTION LAYOUTS



SR100A

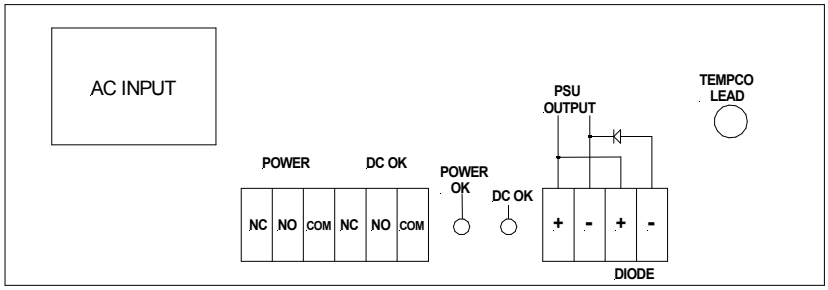
ALARM VERSIONS

Relay contacts shown in **de-enegised** state (ie when there is a fault condition).
Alarm relays are **energised** when power supply is operating normally, eg. “Power” alarm relay is energised when ac input is present.

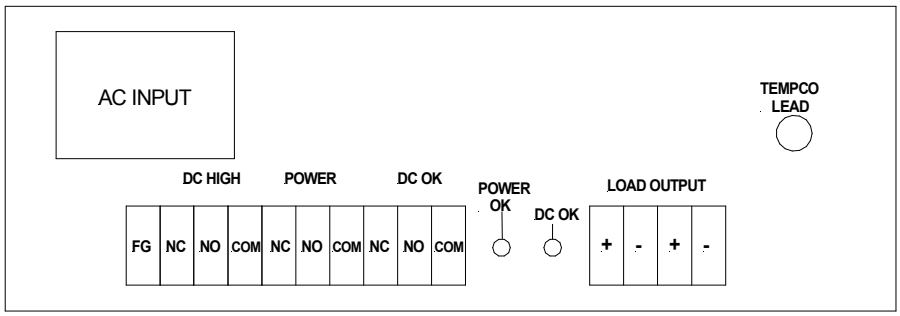


SR100D

optional temperature compensation sensor lead



SR100P with output diode.
Note that the diode is in negative line.
(tempco lead optional)



SR100L (tempco optional)

3.0. LED INDICATION CODES

3.1 -D version

Power: On = ac input present
Off = no input or short circuit on output

DC OK: Steady on = DC output OK
Slow flash = DC output low or battery low (eg. 11, 22, 33, 44V)

3.2 -L Alarm version

Power: On = ac input present
Off = no input or short circuit on output

DC OK : Steady on = DC output OK
Slow flash = DC output low or battery low (eg. 11, 22, 33, 44V)
Fast flash = DC high (1.2xVnom for PSU, 2.5V/cell for charger, unless otherwise specified)

4.0 FG - Frame Ground

Where provided, this terminal provides a connection to the metal case for an earthing point.

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SR100A

incl. SR100D, SR100P, SR100L

- **Industrial quality AC/DC power supply**
- **Suitable for float charging of lead acid batteries**
- **Constant current limit**
- **Precise voltage control**
- **Efficient modern 'current-mode' topology**
- **Temperature compensation option**
- **Suitable for parallel operation**
- **Optional relay alarm outputs - model SR100D,P**
- **Optional serial communications port, SR100L**
- **ISO9001 design management system**

Ideal as a Standby Float Charger for lead acid batteries

♦ 24 Month Warranty

SPECIFICATIONS All specifications are typical at nominal input, full load and at 20°C unless otherwise stated.

ELECTRICAL

Input	180V - 264VAC 45-65Hz or 200 - 375V DC (standard) 88V - 132VAC 45-65Hz or 110-180VDC (on request)
Fusing / Protection	Internal AC input fuse
Isolation	1KV DC input - output / earth
Efficiency	≥ 85%
Inrush current	<30A, 1.8ms
Output Power	100W Continuous (0 - 50°C)
Output Voltages (nominal)	13.8V, 24V, 36V, 48V Other voltages by request.
Voltage adj. range	85 - 115% of Vout
Temp. Compensation ***(option)***	Temperature sensor on 1.7m lead with adhesive pad: -4mV / °C / cell ±10%
Over current Protection	Constant current limit under overload and short circuit conditions
Line Regulation	<0.04% over input range
Load Regulation	<0.5% open circuit to 100% load
Noise	<0.3%
Transient response	200mV over/ undershoot, load step 20-100%, 400us settling time
Hold-up time	15 - 20 ms (nom. - max. Vin) without battery

PHYSICAL

AC Input connector	IEC320 inlet socket (similar to PCs etc.)
DC Connections	Plug-in style socket & mating screw terminal block: (max. wire 2.5mm² / way)
Enclosure	Zinc plated steel /powder coated lid
Indicators	Green LED for **DC Power OK**
Weight	0.94 Kg
Dimensions	146.5 W x 62 H x 177 D mm

ENVIRONMENTAL

Operating temperature	***Standard:*** 0 to 50 °C ambient at full load ***Option - Low temp:*** -20 to 50 °C ambient at full load, add suffix **-LT** De-rate linearly >50 °C to 0 load @ 70 °C
Storage temperature	-20 to 85 °C ambient
Humidity	0 - 95% relative humidity non-condensing
Cooling	Natural convection

STANDARDS

EMI	to CISPR 22 / EN55022 class A
Safety	to IEC60950 / EN60950 / AS/NZS3260

ACCESSORIES SUPPLIED

Mounting Feet together with screws
AC power cord Standard 1.5m lead with IEC320 socket / local plug
DC connectors with mating screw-terminal plug

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100 Watt
AC/DC Stand Alone Power Supply/Float Charger

SR100A

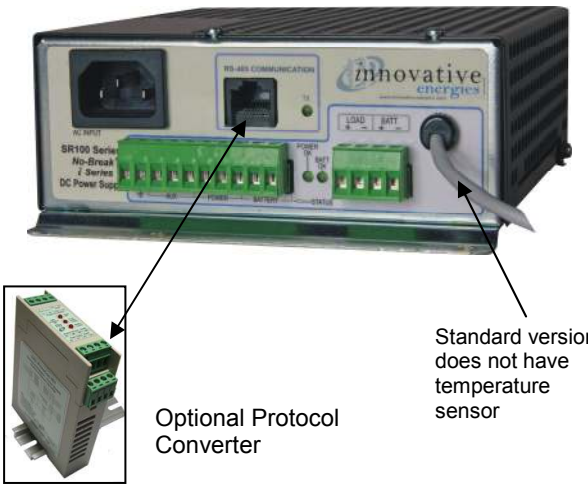
incl. SR100D, SR100P, SR100L

STANDARD MODEL TABLE

MODELS	Power Supply		Battery Charger*		Adjustable range (V)
	Output Volts (factory default)	Output Current (A) (continuous)	Output Volts* (Charging)	Output Current (A) (Charging)	
SR100A12	13.8	7.3	13.8	7.3	11-14
SR100A24	24	4.2	27.6	3.6	22-28
SR100A30	30	3.3	34.5	2.9	27-33
SR100A36	36	2.8	41.4	2.6	34-43
SR100A48	48	2.1	55.2	1.8	45-57

*Please specify on ordering if unit is to be used for battery charging duty (except for 12V version which is set for 13.8V as standard)

OPTIONAL COMMUNICATION PORT



Available on SR100L… models:

- Three comms. options available: RS485, RS232, Ethernet
- With three relay alarm outputs
- Optional MODBUS protocol converter

CABINET OPTIONS

19"Rack mount	2U sub rack option: add **SR-RM2U**
Wall Mount Cabinet	May be fitted into a cabinet which includes two MCBs and I/O terminals Cabinet code: **SEC-SR**

ELECTRICAL OPTIONS

Temperature Compensation	For accurate battery charging, temperature compensation adjusts voltages in accordance with external temperature probe Order Code: **+TEMPCO**
Alarms : *SR100D*	• **Mains fail** • **DC low** (Battery low or PSU low) - Charger: set at 1.83V/cell (80% Vout) - PSU: set at 83% V out
SR100L	• **As SR100D plus extra DC alarm** and optional comms port
Alarm Relay Contacts	C - NO - NC changeover, rated 30VDC,2A /110VDC,0.3A/125VAC,0.5A
Parallel Redundancy	Use output diode for N+1 redundancy **24V & above:** SR100**P** with alarms and internal diode **12V:** use SR100**D**12.. and **+P15** external diode

MODEL CODING

SR100A12TXG-485

Optional Communications Interface Port	**485** = RS485 (for SR100**L**… versions only)	**232** = RS232 **LAN** = ETHERNET
Input voltage and front Panel standby switch	230V AC no switch = blank 110V AC no switch = **G**	
Output DC connector	Phoenix combicon (plug in screw terminal block) = **X**	
Temperature Compensation	Yes = **T**	No = blank
DC output: Nominal voltage	12, 24, 30, 36, 48	
Function	**A** = Standard **D** = A with two alarms **P** = D with internal output diode **L** = D with extra alarm and ***optional*** comms port if required	
Power	100W	

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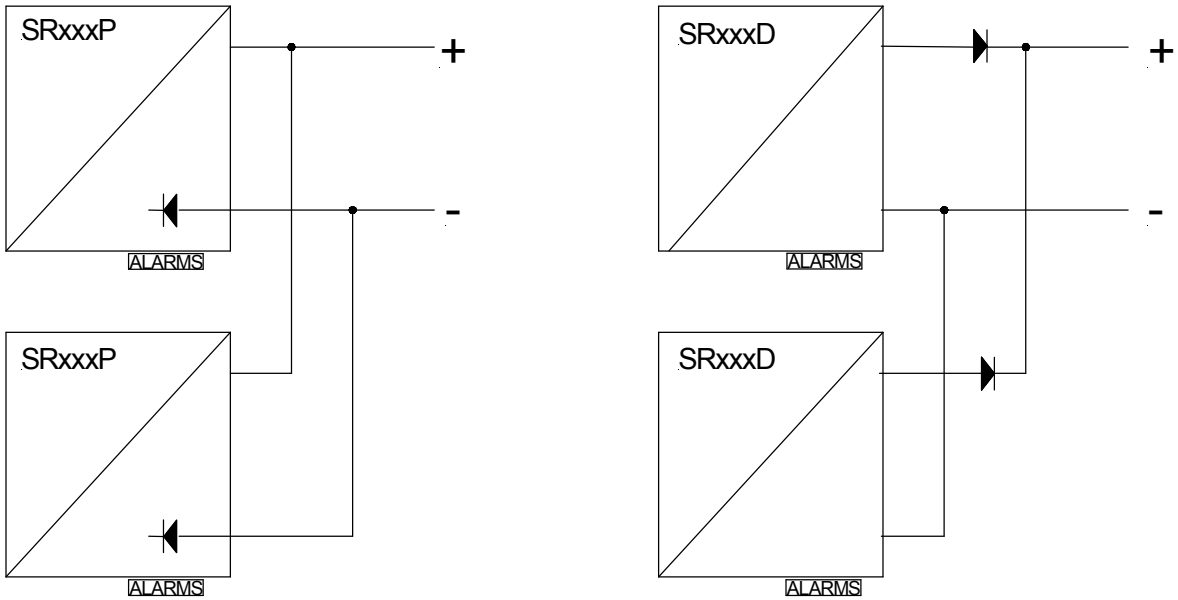
CONNECTION FOR PARALLEL REDUNDANCY

Two or more SRxxx A series power supplies may be connected in parallel for increased power (with or without diodes). It is essential that the wiring from each unit to the load is kept identical for equal power sharing particularly when diodes are not used.

Two or more SRxxx D series power supplies (standard PSU with alarms), may be connected in parallel for N+1 redundancy using output diodes shown.

Diodes can be fitted inside some power supplies (see models listed below).
The SRxxx P series identifies when an internal diode is fitted in the power supply.



INTERNAL diodes can be fitted to the following models only (diode is fitted in negative line):

100W: SR100P24, SR100P36, SR100P48

250W: SR250P24, SR250P30, SR250P36, SR250P48, SR250P60

All other models have diodes external to the power supply, eg fitted into a 2U rack as shown in the photo to the right.

2U rack with 2 x SR250D12 power supplies and decoupling diodes on heatsink plus V/I meter

Safety

The user is responsible for ensuring that input and output wiring segregation complies with local standards and that in the use of the equipment, access is confined to operators and service personnel. A low resistance earth connection is essential to ensure safety and additionally, satisfactory EMI suppression (see below).

HAZARDOUS VOLTAGES EXIST WITHIN A POWER SUPPLY ENCLOSURE AND ANY REPAIRS MUST BE CARRIED OUT BY A QUALIFIED SERVICEPERSON.

Electrical Strength Tests

Components within the power supply responsible for providing the safety barrier between input and output are constructed to provide electrical isolation as required by the relevant standard. However EMI filtering components could be damaged as result of excessively long high voltage tests between input, output and ground. Please contact our technicians for advice regarding electric strength tests.

Earth Leakage

The EMI suppression circuits causes earth leakage currents which may be to the maximum allowable of 3.5mA.

Ventilation

High operating temperature is a major cause of power supply failures, for example it has been well documented that a 10^{o}C rise in the operating temperature of a component will halve its expected life. Therefore always ensure that there is adequate ventilation for the equipment. Batteries and cooling fans also suffer shortened lifetimes if subjected to high ambient temperatures - both should be included in a routine maintenance schedule to check for signs of reduced efficiency.

Water / Dust

Every effort must be made in the installation to minimise the risk of ingress of water or dust. Water will almost always cause instant failure. The effects of dust are slower in causing failure of electronic equipment but all electrical equipment should be cleaned free of any dust accumulation at regular intervals.

Electromagnetic Interference (EMI)

Switching power supplies and converters inherently generate electrical noise. All wiring should be as short as practicable and segregated from all equipment wiring which is sensitive to EMI. Residual noise can be reduced by looping DC wiring through ferrite cable sleeves. These are most effective as close to the power supply as possible and as many turns of the wire taken through the core (+ and - in the same direction) as the core will accommodate.

Fuse ratings

Check that the wiring and fuses or MCBs match the rating of the PSU or converter. Note that the Innovative Energies *No-Break*^{TM} *DC* chargers are able to deliver up to 2.5 times the rated current when mains power is on.

Connection polarity

It is critical to check the polarity carefully when connecting DC devices. Some Innovative Energies models have reverse polarity protection (RPP), for example, the *Smartchargers* have electronic (non-destructive) RPP, the *No-Break*^{TM} *DC* range has an internal fuse which needs to be replaced if the battery is connected in reverse. Usually, however, a reverse polarity connection results in instant destruction of the device, especially if there is a battery involved.

Glossary of terms used in our user manuals

PSU = power supply unit

BCT = battery condition test

ECB = electronic circuit breaker

ELVD = electronic low voltage disconnect

RPP = reverse polarity protection

EMI = electromagnetic interference

SNMP = Simple Network Management Protocol

LAN = local area network

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TERMS OF WARRANTY

Innovative Energies Ltd warrants its power supplies for 24 months (two years) from date of shipment against material and workmanship defects.

Innovative Energies' liability under this warranty is limited to the replacement or repair of the defective product as long as the product has not been damaged through misapplication, negligence, or unauthorized modification or repair.

Thank you for purchasing from Innovative Energies.

We trust your power supply will exceed your expectations and perform for years to follow.

Sincerely,
The Innovative Energies team.

Innovative Energies Limited

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